SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES
DEPARTMENT 308 HON. CHARLES W. MC COY, JUDGE
RICHARD BOEKEN,)
)
PLAINTIFF,)
)
VS.) SUPERIOR COURT
) CASE NO. BC 226593
PHILIP MORRIS, INCORPORATED,)
A CORPORATION; INTERNATIONAL HOUSE)
OF PANCAKES, INCORPORATED, A)
CORPORATION,)
)
DEFENDANTS.)
)
REPORTER'S DAILY TRANSCRIPT OF PROCEEDINGS
WEDNESDAY, APRIL 18, 2001
P.M. SESSION
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I N D E X

1 CASE NUMBER: BC 226593
2 CASE NAME: BOEKEN V. PHILIP MORRIS
3 LOS ANGELES, CALIFORNIA WEDNESDAY, APRIL 18, 2001
4 DEPARTMENT 308 HON. CHARLES W. MC COY, JUDGE
5 APPEARANCES: (AS NOTED ON TITLE PAGE.)
6 REPORTER: LINDA STALEY, CSR NO. 3359, RMR, CRR
7 TIME: 1:35 P.M.
8
9 - - O - -
10
11 SAM HAMMAR,
12 WITNESS, RESUMED THE STAND AND TESTIFIED FURTHER AS FOLLOWS:
13
14 THE COURT: THANK YOU TO OUR SWIFT MOVING COURT
15 ATTENDANT.
16 PLEASE BE SEATED.
17 ALL RIGHT. OUR JURY PANEL IS PRESENT; COUNSEL
18 PRESENT; THE WITNESS IS ON THE WITNESS STAND.

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SIR, YOU UNDERSTAND YOU ARE STILL UNDER OATH?
THE WITNESS: YES, SIR.
THE COURT: ALL RIGHT. VERY WELL.
MR. PIUZE.
MR. PIUZE: THANK YOU, YOUR HONOR.

DIRECT EXAMINATION (RESUMED)
BY MR. PIUZE:
Q. THIS IS 8050.11?
A. SURE.

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Q. YOU TOLD US ABOUT THE FACT YOU'RE A PATHOLOGIST, HOW LONG YOU'VE BEEN A PATHOLOGIST, WHERE YOU WENT TO, WHERE YOU'VE TAUGHT, WHERE YOU'VE BEEN PRACTICING. DO YOU HAVE A PART OF THE BODY IN WHICH YOU SPECIALIZE?
A. I DO.
Q. WHAT'S THAT?
A. THE LUNGS.
Q. IS THAT CALLED A PULMONARY PATHOLOGIST?
A. YES. PULMONARY AND LUNG ARE SYNONYMOUS.
Q. I'M GOING TO SHOW THIS TO YOU ONE MORE TIME, THEN YOU WON'T BE ABLE TO SEE IT FOR AWHILE. OKAY?
A. OKAY.
Q. WHAT PERCENTAGE OF YOUR TIME NOW -- NOT IN THE ACADEMIC FIELD, BUT OUT IN THE REAL WORLD. WHAT PERCENTAGE OF YOUR TIME DO YOU SPEND WITH PULMONARY OR CHEST, LUNG PATHOLOGY AS OPPOSED TO OTHER PARTS OF THE BODY?
A. APPROXIMATELY 85 PERCENT.
Q. NOW, AS AN OVERVIEW, IN THE REAL WORLD, WHAT DOES A PULMONARY PATHOLOGIST DEAL WITH BESIDES LUNG CANCER, PLEASE?
A. THERE ARE ALL KINDS OF LUNG DISEASE THAT RANGE FROM CONGENITAL TYPE DISEASES OF THE LUNG, LIKE EXTRA LOBES OR CONGENITAL CYSTS IN THE LUNGS, TO A WIDE VARIETY OF WHAT ARE CALLED INTERSTITIAL LUNG DISEASES IN WHICH YOU GET CHANGES IN THE INTERSTITIUM OF THE LUNG WHICH IS THE

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SUPPORTIVE FRAMEWORK OF THE LUNG.
THERE ARE A WIDE NUMBER OF INFECTIOUS DISEASES THAT OCCUR IN THE LUNGS RANGING ANYWHERE FROM ORDINARY BACTERIAL PNEUMONIA TO SOME VERY RARE INFECTIONS THAT WE SOMETIMES SEE IN PATIENTS WITH AIDS.
ONE OF MY BIGGEST INTERESTS IN THE LUNGS HAS TO DO WITH THE LINING OF THE LUNG AND THE CHEST CAVITY, WHICH IS CALLED THE PLEURA. AND THAT GIVES RISE TO A RARE TYPE OF CANCER CALLED MESOTHELIOMA CAUSED BY ASBESTOS. I SEE A LOT OF THAT. SO THERE'S JUST A WIDE RANGE OF DISEASES OF THE LUNGS.
IN THE BOOK THAT I'M A COEDITOR OF, THERE ARE 35 CHAPTERS IN THAT BOOK, AND IT'S 1565 PAGES LONG. SO I THINK THAT KIND OF GIVES YOU AN IDEA THAT THERE'S QUITE A BIT OF INFORMATION TO TALK ABOUT WHEN YOU TALK ABOUT DISEASES OF THE LUNG FROM A PATHOLOGIST'S VIEWPOINT.
Q. THANK YOU.
IF YOU'RE SPENDING 85 PERCENT OF YOUR PROFESSIONAL TIME ON LUNGS, ROUGHLY WHAT PERCENTAGE OF YOUR PROFESSIONAL TIME DO YOU SPEND ON LUNG CANCER -- ONE FORM OR ANOTHER OF LUNG CANCER, PLEASE?
A. PROBABLY, ABOUT, I WOULD SAY, 40 PERCENT.
Q. 40 PERCENT. GOOD ENOUGH.

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OVER THE COURSE OF THE YEARS, UNDER WHAT CIRCUMSTANCES HAVE YOU REVIEWED SLIDES THAT CONTAIN TISSUE FROM PEOPLE'S LUNGS?
A. WELL, I'VE REVIEWED IT AS A PRACTICING PATHOLOGIST THROUGHOUT MY CAREER.

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WHEN I WAS AT THE UNIVERSITY OF UTAH, WHEN I WAS AT VIRGINIA MASON MEDICAL CENTER IN SEATTLE, AND WHEN I WORKED AS A PATHOLOGIST IN BREMERTON. I SAW CASES BOTH FROM BIOPSY, SPECIMENS TAKEN BY PULMONARY MEDICINE DOCTORS SENT TO ME. AND ALSO, I'VE SEEN CASES OF RESECTED LUNGS AND RESECTED PORTIONS OF LUNGS THAT WERE SENT TO ME BY SURGEONS.
I'VE ALSO DONE SEVERAL HUNDRED AUTOPSIES OR HAVE EVALUATED SEVERAL HUNDRED AUTOPSY SPECIMENS OF PEOPLE WHO HAVE DIED FROM LUNG CANCER. SO A WIDE VARIETY OF TYPE OF SPECIMENS.
Q. IN YOUR DAY-TO-DAY PRACTICE AS IT HAS EXISTED OVER THE LAST, ARBITRARILY, 10 OR 15 YEARS, IN THAT AREA, SOMETIMES, DO DOCTORS FROM LOS ANGELES SEND SLIDES ALL THE WAY UP TO WASHINGTON FOR YOU TO LOOK AT?
A. YES. IN FACT, I KNOW A FEW OF THE PATHOLOGISTS AT UCLA. AND DR. SONITA BHUTA, B-H-U-T-A, IS A VERY GOOD FRIEND OF MINE. AND I WOULD SAY, ABOUT EIGHT MONTHS AGO, MAYBE MORE THAN THAT -- TIME GOES FAST -- SHE SENT ME A CASE OF A LESION IN A RELATIVELY YOUNG MAN WHO WAS HOSPITALIZED AT UCLA IN WHICH ONE OF THE PATHOLOGISTS THERE HAD MADE A DIAGNOSIS OF A SARCOMA OF THE LUNG.
AND WHAT SARCOMA MEANS IS A MALIGNANCY OF CELLS THAT ARE USUALLY SPINDLE SHAPED OR ELONGATED, WHICH IS A VERY RARE TYPE OF PRIMARY CANCER IN THE LUNG. MOST OF THE SARCOMAS ONE WOULD SEE IN THE LUNG WOULD BE METASTATIC FROM ANOTHER SITE.
BUT I LOOKED AT THAT CASE, AND I WAS CERTAIN THAT THIS WASN'T A CANCER. I THOUGHT -- I THOUGHT IT WAS

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WHAT IS CALLED AN INFLAMMATORY PSEUDOTUMOR. AND "PSEUDO" MEANS FALSE; "TUMOR" JUST MEANS A MASS.
AND I SHARED IT WITH A FRIEND OF MINE IN SEATTLE WHO WAS THE COEDITOR OF THIS BOOK THAT WE WROTE. HE CAME TO THE SAME DIAGNOSIS.
SO I SENT BACK A REPORT TO SONITA TELLING HER THAT, IN MY OPINION, THIS WAS NOT A SARCOMA; THIS WAS AN INFLAMMATORY REACTION, AND THIS PATIENT WILL BE FINE. AND I TALKED TO HER NOT TOO LONG AGO AND SHE SAID THAT THERE HAD BEEN NO EVIDENCE THAT THIS MAN HAD A REOCCURRENCE, AND HE WAS WELL. SO I'VE SEEN A FEW CASES FROM UCLA.
I'VE SEEN SEVERAL CASES THAT ARE SENT TO ME FROM OTHER PATHOLOGISTS, FOR EXAMPLE, DOWN AT EISENHOWER MEDICAL CENTER, RANCHO MIRAGE, CALIFORNIA, AND WE DO THE EM WORK FOR TWO HOSPITALS IN SAN FRANCISCO.
BY "EM," I MEAN ELECTRON MICROSCOPY.
Q. THANK YOU. THIS MORNING, I THINK YOU WERE ON THE WITNESS STAND FOR 17 MINUTES OR SOMETHING LIKE AND NOW, IN THE FIRST FIVE MINUTES THIS AFTERNOON, YOU'VE USED THE TERM "PRIMARY," AND THIS TIME WHEN YOU USED IT, YOU USED IT IN CONJUNCTION WITH METASTATIC.
AND I WOULD APPRECIATE IT IF YOU'D TAKE A COUPLE OF MINUTES AND EXPLAIN TO THE JURY WHAT A PRIMARY TUMOR IS AND WHAT METASTATIC HAS TO DO WITH OR DOESN'T HAVE TO DO WITH A PRIMARY TUMOR, PLEASE.
A. SURE. A PRIMARY TUMOR IS DEFINED AS A TUMOR, USUALLY A CANCER, THAT'S ARISING IN AN ORGAN WHERE IT ORIGINATED FROM.

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FOR EXAMPLE, PRIMARY LUNG CANCER WOULD BE A CANCER THAT AROSE IN THE LUNG AND WAS DERIVED FROM SOME OF THE CELLS, ONE OR MORE DIFFERENT TYPES OF CELLS IN THE LUNGS. A METASTATIC CANCER IN THE LUNG, OR WHAT'S SOMETIMES REFERRED TO AS SECONDARY CANCER IN THE LUNG, WOULD BE A CANCER THAT HAD COME FROM SOME OTHER PART OF THE BODY. FOR EXAMPLE, IN THE CASE OF SARCOMA, MAYBE A PERSON HAD MASS IN THEIR LEG THAT TURNED OUT TO BE A CANCER OF CELLS OF CONNECTIVE TISSUE IN THEIR LEG, AND THAT TUMOR INVADED BLOOD VESSELS AND METASTASIZED OR SPREAD TO THE LUNG. THAT WOULD BE A METASTATIC TUMOR OF THE LUNG OR A SECONDARY. IT TURNS OUT THAT PRIMARY LUNG CANCERS DO METASTASIZE, AND THEY HAVE SOME FAIRLY CHARACTERISTIC SITES THAT THEY METASTASIZE TO. THE MOST COMMON BEING THE LYMPH NODES THAT SURROUND THE LUNG WHERE THE AIR TUBES AND VESSELS ENTER. THE LYMPH NODES IN THE CENTER OF THE CHEST. AND THEN THE NEXT MOST COMMON SITE OUTSIDE OF THE CHEST WOULD BE THE ADRENAL GLANDS. NEXT MOST COMMON WOULD BE THE LIVER. NEXT MOST COMMON WOULD BE THE BONE. AND THE NEXT MOST COMMON WOULD BE THE BRAIN.

Q. THANK YOU.

SO TO TAKE THAT AND PUT IT INTO MR. BOEKEN'S EQUATION, RIGHT NOW, WE'RE TOLD, HE HAS BRAIN CANCER. DOES HE HAVE PRIMARY CANCER OR METASTATIC BRAIN CANCER?

A. HE HAS A METASTATIC CANCER. HE HAS A PRIMARY CANCER IN THE LUNG IN THE RIGHT UPPER LOBE THAT HAD PREVIOUSLY METASTASIZED TO HIS BRAIN. PREVIOUSLY, IN THE

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PATHOLOGY MATERIAL, THAT WAS REMOVED WHEN HE HAD HIS SURGERY IN 1999. HE HAD METASTASIS TO THE LYMPH NODES. AND AFTER THAT, IT HAD METASTASIZED TO HIS THIRD LUMBAR, AND I THINK FOURTH LUMBAR CEREBRAL BODY. THAT'S PART OF THE LOWER SPINE.

Q. THANK YOU.

NOW, HERE'S WHERE WE WERE. UP IN WASHINGTON, VARIOUS HOSPITALS AROUND THE STATE OF CALIFORNIA AND DOCTORS AROUND THE STATE OF CALIFORNIA, INCLUDING UCLA MEDICAL CENTER, SOMETIMES SEND YOU LUNG TISSUE TO TAKE A LOOK AT, RIGHT?

A. YES.

Q. OKAY. WHEN YOU LOOKED AT MR. BOEKEN'S LUNG TISSUE -- JUST TO GIVE US AN IDEA FOR SOMEONE THAT'S BEEN DOING THIS ALL OF HIS LIFE AND KNOWS WHAT HE OR SHE IS DOING -- HOW LONG DO YOU HAVE TO LOOK AT THE SLIDES BEFORE YOU KNOW WHAT IT'S ALL ABOUT?

A. NOT VERY LONG. I MEAN, IT'S PRETTY OBVIOUS, USUALLY, IN MOST CANCER CASES WHETHER IT'S CANCER OR NOT. AND THERE ARE FAIRLY WELL-DEFINED CRITERIA FOR DIAGNOSING THE FOUR MAJOR SUBTYPES OF LUNG CANCER, AND YOU CAN USUALLY FIGURE THAT OUT PRETTY FAST.

Q. OKAY. LET'S START -- IF I COULD, LET ME GUIDE YOU.

LET'S START WITH WHAT'S CANCER?

JUST A BRIEF, WHAT'S CANCER?

A. OKAY. CANCER IS A TYPE OF DISEASE PROCESS THAT'S ALSO REFERRED TO AS A MALIGNANT NEOPLASM. AND NEOPLASM COMES FROM TWO WORDS. "NEO," MEANING NEW; AND

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"PLASM," MEANING GROWTH. SO A CANCER SYNONYMOUS WITH A MALIGNANT NEW GROWTH.

AND IT IS A DISEASE CHARACTERIZED BY A PROLIFERATION OF A CELL THAT NO LONGER IS UNDER NORMAL GROWTH

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5 CONTROL MECHANISMS OF THE BODY. THAT MEANS IT IS AN IMMORTAL
6 CELL THAT CAN START DOUBLING AND GROWING IN A WAY THAT THE
7 BODY CANNOT CONTROL IT.
8 IT'S ALSO CHARACTERIZED BY TWO BAD THINGS. ONE
9 IS THAT AS THESE CANCER CELLS CONTINUE TO GROW, THEY START TO
10 UNDERGO ADDITIONAL GENETIC MUTATIONS, AND THEY ARE ABLE TO
11 INVADE NORMAL TISSUE BY PRODUCING ENZYMES THAT DIGEST THE
12 TISSUE THAT THEY ARE SURROUNDED BY.
13 THEY ALSO HAVE THE ABILITY TO INVADE INTO
14 LYMPHATIC CHANNELS, WHICH ARE CHANNELS WHICH CARRY THE LYMPH
15 IN THE BODY AND ALSO INTO BLOOD VESSELS, AGAIN, BY PRODUCING
16 THESE ENZYMES THAT DEGRADE THE WALLS OF THE BLOOD VESSELS AND
17 THE LYMPHATIC CHANNELS.
18 ONCE THEY GAIN ACCESS TO THE LYMPHATIC CHANNELS
19 OR THE BLOOD VASCULAR CHANNELS, THEY ARE THEN ABLE TO SPREAD
20 TO OTHER PARTS OF THE BODY, AND THAT PROCESS, WHICH IS
21 ANOTHER CHARACTERISTIC OF CANCER, IS CALLED METASTASES.
22 Q. THANK YOU. SO THAT'S WHAT CANCER IS.
23 WHAT'S LUNG CANCER?
24 A. LUNG CANCER IS A PRIMARY CANCER OF THE LUNG.
25 THAT MEANS IT ORIGINATED IN THE LUNG, AND THAT'S WHERE IT
26 CAME FROM.
27 Q. LET ME JUST SHOW YOU THIS, AND I'M POINTING TO
28 THE TUMOR.
2857
1 OF COURSE, YOU KNOW THAT'S WHERE IT IS?
2 A. RIGHT. IN THE RIGHT UPPER LOBE.
3 Q. HOW DID THAT COME TO BE?
4 DID THAT HAPPEN OVERNIGHT, OVER THE COURSE OF
5 THREE DAYS, OVER THE COURSE OF 50 YEARS, SOMETHING OTHER THAN
6 THOSE?
7 A. IT HAPPENED OVER A LONG TIME. AND THE CURRENT
8 CONCEPT OF CANCER IS RELATIVELY STRAIGHTFORWARD, AND THIS IS
9 THOUGHT TO APPLY TO BASICALLY EVERY TYPE OF SOLID CANCER
10 THERE IS IN THE BODY.
11 AND WHAT IT INVOLVES IS THAT THERE ARE
12 CARCINOGENS, SOME THAT WE KNOW OF AND SOME THAT WE DON'T,
13 THAT ARE ABLE TO CHANGE THE DNA IN CELLS. AND THE DNA IN
14 CELLS IS THE MATERIAL IN THE NUCLEUS THAT CONTROLS WHAT THE
15 CELL DOES.
16 AND THE WAY CARCINOGENS ACT ON THE DNA IS
17 PRIMARILY RELATED TO THREE TYPES OF GENES, AND GENES ARE MADE
18 UP OF DNA THAT DO CERTAIN THINGS OR TELL THE CELLS TO DO
19 CERTAIN THINGS.
20 AND ONE SET OF GENE IS REFERRED TO AS GENES
21 THAT CONTROL CELL GROWTH OR CELL REPLICATION, AND THOSE ARE
22 SCIENTIFICALLY CALLED PROTO-ONCOGENES. P-R-O-T-O, DASH,
23 ONCOGENES, O-N-C-O-G-E-N-E-S. "ONCO" MEANS CANCER, AND THEN
24 "GENES." SO IT'S A CANCER GENE.
25 AND THEN THEY ALSO HAVE AN EFFECT ON WHAT ARE
26 CALLED TUMOR SUPPRESSOR GENES. THOSE ARE SOMETIMES CALLED
27 ANTI-ONCOGENES. THEY CONTROL REGULATED CELL DEATH. AND THAT
28 IS, THAT ALL OF OUR CELLS IN OUR BODY THAT FORM THESE VARIOUS
2858
1 TISSUES, LIKE OUR SKIN, OUR LUNGS, OUR HEART, THEY HAVE A
2 TURNOVER RATE. AND THAT TURNOVER RATE IS GENETICALLY
3 DETERMINED BY, BASICALLY, OUR BODIES GENETIC MAKEUP. SO
4 THOSE CELLS NORMALLY DIE AFTER A PERIOD OF TIME.
5 FOR EXAMPLE, A RED BLOOD CELL THAT COMES FROM
6 YOUR BONE MARROW, THAT SURVIVES 130 DAYS AND THEN IT DIES,
7 AND IT'S RELEASED BY ANOTHER ONE FROM THE BONE MARROW.
8 YOUR SKIN, IT TAKES 28 DAYS FOR A CELL TO GET
9 FROM THE BOTTOM OF YOUR SKIN TO THE TOP YOUR SKIN. AND

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10 THINGS LIKE THAT.
11 SO ANOTHER ASPECT OF CANCER IS A MUTATION OR
12 CHANGE IN THE GENES THAT CONTROL THIS CELL DEATH. AND THEN
13 THE THIRD MUTATION IS CHANGES IN THE GENE THAT TRY TO REPAIR
14 THESE OTHER DAMAGED GENES. AND THOSE ARE REFERRED TO AS
15 DNA-REPAIRED GENES. CANCER INVOLVES CHANGES IN THESE GENES.
16 AND WHAT USUALLY HAPPENS OVER A PERIOD OF
17 YEARS, WHERE A PERSON IS EXPOSED TO CARCINOGENS, BE IT
18 CIGARETTE SMOKE, ASBESTOS, BERYLLIUM, ARSENIC, WHATEVER, IS
19 THAT THESE SUBSTANCES ACT ON THOSE GENES, AND OVER A PERIOD
20 OF TIME, CAUSES THE CHANGES.
21 AND WHAT HAPPENS, AT LEAST FROM A PATHOLOGIST'S
22 POINT OF VIEW, IS THAT THE FIRST CHANGE THAT YOU SEE IN THE
23 TISSUE, IF YOU CAN EXAMINE IT, IS AN INCREASE NUMBER OF
24 CELLS, AND THAT PROCESS IS REFERRED TO AS HYPERPLASIA.
25 "HYPER" MEANS INCREASE; "PLASIA" MEANS NUMBER OF CELLS, AN
26 INCREASE IN THE NUMBER OF CELLS.
27 AND THEN IT WILL CONTINUE FROM THERE INTO
28 WHAT'S CALLED DYSPLASIA, IN WHICH THE CELLS START TO BECOME
2859
1 ABNORMAL, AND THEY GET ABNORMAL DNA. AND THEN EVENTUALLY, IT
2 WILL GET INTO A PROCESS CALLED CARCINOMA IN SITU, WHICH MEANS
3 CANCER IN SITU, WHERE IT IS PRESENT IN THAT ORGAN BUT HAS NOT
4 YET INVADED. AND THEN IT WILL INVADE, AND THAT'S CALLED
5 INVASIVE CANCER.
6 AND THE BEST THING TO MAYBE ILLUSTRATE THIS, BY
7 WHICH I THINK MOST OF THE WOMEN WILL RELATE TO, IS THAT OF
8 CERVICAL CANCER. THEY GET PAP SMEARS TO DETECT THOSE
9 DYSPLASTIC CELLS OR CANCER IN SITU. SO IF THOSE ARE
10 DETECTED, THEN THEY CAN HAVE THAT AREA EXCISED AND THEIR
11 CANCER CAN BE ERADICATED BEFORE IT INVADES. AND HOW LONG
12 THIS TAKES CAN BE AS MANY AS 20, 30 YEARS FROM THE TIME A
13 PERSON IS FIRST EXPOSED TO A CARCINOGEN.
14 IN THIS PROCESS, IN SOLID CANCERS LIKE LUNG
15 CANCERS, KIDNEY CANCER, COLON CANCERS, BRAIN CANCERS,
16 WHATEVER, A SINGLE CELL IS ORIGINALLY FORMED THAT HAS THE
17 ABILITY TO ACT AS A CANCER CELL. AND IT UNDERGOES A CLONAL
18 PROLIFERATION, WHICH MEANS THAT IT STARTS TO DOUBLE ONE CELL
19 INTO TWO, TWO INTO FOUR, FOUR INTO EIGHT, EIGHT TO SIXTEEN,
20 ET CETERA, ET CETERA.
21 AND IT TAKES ABOUT 20 DOUBLINGS OF THOSE CELLS
22 TO PRODUCE A TUMOR THAT'S ONLY A MILLIMETER IN DIAMETER.
23 THAT WOULD BE ABOUT A 16TH OF AN INCH. AND DEPENDING ON THE
24 DOUBLING TIME -- THAT MEANS HOW FAST THE CANCER CELL'S
25 GROWING -- THAT COULD TAKE AS LONG AS MAYBE, SAY, FIVE TO TEN
26 YEARS.
27 AND THEN TO GET A TUMOR THAT'S, WHAT,
28 1 CENTIMETER IN DIAMETER -- WHAT, ABOUT, SAY, A LITTLE BIT --
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1 ABOUT A HALF INCH IN DIAMETER, THAT TAKES 30 DOUBLINGS. AND
2 SO, SAY, AN ADENOCARCINOMA OF A LUNG WOULD BE AN AVERAGE
3 DOUBLING TIME OF ABOUT 100 DAYS. SO TO GET A TUMOR THAT
4 SIZE, 1 CENTIMETER, WOULD BE 30 TIMES 100, WHICH WOULD BE
5 3,000, DIVIDED BY 365 DAYS -- ABOUT EIGHT, NINE YEARS TO
6 PRODUCE A TUMOR THAT SIZE.
7 IT TURNS OUT THAT MOST LUNG CANCERS IN HUMANS
8 ARE DETECTED WHEN THEY'RE ABOUT THE SIZE OF A GOLF BALL,
9 ABOUT THREE TO THREE-AND-A-HALF CENTIMETERS IN DIAMETER. AND
10 BY THAT TIME, UNFORTUNATELY, THEY'VE ALREADY UNDERGONE ABOUT
11 35 DOUBLINGS, AND THEY HAVE COMPLETED WHAT IS REFERRED TO AS
12 THREE QUARTERS OF THEIR LIFE. WHICH MEANS THAT, IN MOST
13 PEOPLE, BY THE TIME A CANCER IS DETECTED IN THE LUNG, IT HAS
14 ALREADY BEEN THERE THREE QUARTERS OF ITS TOTAL LIFETIME, AND

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THAT'S WHY LUNG CANCER IS SUCH A HARD DISEASE TO TREAT.
Q. IS IT SUCH A HARD DISEASE TO TREAT BECAUSE BY
THE TIME IT'S DISCOVERED, IT'S GOT SUCH A BIG FOOTHOLD THAT
IT'S TOO LATE?
A. EXACTLY.
Q. NOW. I'M LOOKING AT THIS. I'M JUST GOING TO
FLASH IT AT YOU ONE MORE TIME. I'M LOOKING AT THIS
ILLUSTRATION. IT SAYS, "2 CENTIMETER MASS."
THERE ARE PLACES IN THE MEDICAL RECORDS,
ESPECIALLY THE PATHOLOGY RECORDS, WHICH DESCRIBE THIS AS
1-1/2 CENTIMETER MASS?
A. YES. PATHOLOGY SAID THE MAXIMUM DISEASE WAS
1.5 CENTIMETERS.
Q. DOES IT MATTER FOR ANY OPINION THAT YOU'RE

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GOING TO GIVE HERE WHETHER IT'S ONE AND A HALF CENTIMETERS OR
TWO CENTIMETERS?
A. NO.
Q. WAS MR. BOEKEN'S TUMOR THAT WAS DISCOVERED --
WHETHER IT'S ONE AND A HALF OR TWO CENTIMETERS -- WAS IT
SMALLER THAN MOST LUNG CANCERS THAT ARE DISCOVERED?
A. YES.
Q. DO YOU HAVE AN IDEA WHY THAT WAS?
A. SURE.
Q. WHY?
A. WELL, IF YOU LOOK AT HIS CLINICAL RECORDS, HE
HAD BRONCHITIC SYMPTOMS, WHICH WOULD BE COUGH, EXCESS MUCOUS
PRODUCTION, WHICH IS A VERY COMMON SYMPTOM IN THE CIGARETTE
SMOKER. AND AT LEAST IN EARLY OCTOBER OF 1999, THERE WAS
SOME THOUGHT BY ONE PHYSICIAN THAT MAYBE HE WAS HAVING A
VIRAL SYNDROME OR VIRAL PROBLEM THAT WAS CAUSING AN EXCESS
NUMBER OF THESE BRONCHITIC-TYPE SYMPTOMS.
SO THAT PHYSICIAN ORDERED A CHEST RADIOGRAPH BE
TAKEN. AND A CHEST X-RAY WAS TAKEN, AND THAT X-RAY SHOWED A
MASS IN THE RIGHT UPPER LOBE. AND I WOULD CONSIDER THIS TO
BE, BASICALLY, AN INCIDENTAL FINDING AS A RESULT OF HIS
BRONCHITIC SYMPTOMS. I DON'T THINK THE SYMPTOMS HE HAD WERE
DIRECTLY RELATED TO THE LUNG CANCER. I THINK THE LUNG CANCER
WAS FOUND AS A RESULT OF THE X-RAY BEING TAKEN FOR THESE
OTHER SYMPTOMS.
Q. SO THE LUNG CANCER WAS SORT OF FOUND BY
ACCIDENT?
A. BY ACCIDENT, YES.

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Q. AND BECAUSE IT WAS FOUND BY ACCIDENT, IT WAS
FOUND A LITTLE EARLIER THAN NORMAL?
A. YES.
Q. OKAY. THANK YOU.
LET'S JUST GO BACK TO THE TIMING AGAIN. I
APPRECIATE YOUR EXPLANATION, BUT A BOTTOM LINE -- RIGHT
TOWARD THE END, I THINK YOU GAVE A BOTTOM LINE.
WAS IT SOMETHING IN THE VICINITY OF FIVE OR SIX
OR SEVEN, OR SOMETHING IN THAT ORDER OF YEARS, FOR THIS
TUMOR, ONCE IT BEGAN, TO GROW THE SIZE THAT IT DID?
A. YES.
Q. AND PRIOR TO THOSE FIVE OR SIX OR SEVEN YEARS,
DID IT TAKE DECADES FOR WHATEVER WAS INITIALLY HAPPENING TO
SET THE STAGE FOR THE TUMOR?
A. IT DID.
IF YOU -- YOU KNOW, MR. BOEKEN WAS BORN IN
1944, AND HE STARTED SMOKING REGULARLY AT AGE 14, SO THAT
WOULD BE 1958. SO IF THAT WAS -- IF THAT WAS THE TIME -- YOU
USED TO SAY THAT THAT WAS THE INITIAL INTRODUCTION OF THE

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20 CARCINOGEN. THAT WOULD HAVE BEEN THE INITIATION OF THE
21 CELLULAR CHANGES THAT EVENTUALLY LED TO THE DEVELOPMENT OF A
22 SINGLE CANCER CELL THAT THEN PROLIFERATED TO FORM THAT MASS.
23 SO 1958 TO 1999 -- THAT WOULD BE 41 YEARS --
24 WOULD BE THE TOTAL LATENT PERIOD, WHICH IS THE TIME FROM
25 EXPOSURE TO THE FIRST CARCINOGENIC EXPOSURE TO THE TIME HE
26 WAS DIAGNOSED WITH THE TUMOR. AND A SIGNIFICANT AMOUNT OF
27 THAT TIME, MAYBE AS MUCH AS 20 PLUS YEARS, MAYBE 30 YEARS,
28 WOULD HAVE BEEN THE CELLAR CHANGES TAKING PLACE THAT LED TO
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1 THE DEVELOPMENT OF THE FIRST CANCER CELL.
2 Q. THANK YOU.
3 IF MR. BOEKEN'S TUMOR -- AND I WANT TO POINT
4 OUT TO YOU, NOT THREE CENTIMETERS, BUT ONE AND A HALF TO TWO
5 CENTIMETERS, IN THAT GENERAL AREA -- IF IT TOOK -- IF IT WAS
6 DIAGNOSED IN 1999, WHEN DO YOU THINK IT STARTED GROWING, THE
7 TUMOR?
8 NOT ALL OF THE CELLULAR CHANGES AND ALL THE
9 DECADES LEADING UP, BUT THE TUMOR ITSELF?
10 A. WELL, BEST ESTIMATE YOU WOULD HAVE WOULD BE --
11 USING 100 DAYS AS DOUBLING TIME -- AND THAT'S BASED ON SOME
12 INFORMATION THAT IS REFERENCED IN THE BOOK I WAS TALKING
13 ABOUT, DOUBLING TIMES THAT HAVE BEEN CALCULATED FOR LUNG
14 CANCERS.
15 AND, OKAY. AND SAY, 20 DOUBLINGS, 30 DOUBLINGS
16 TO PRODUCE 1 CENTIMETER. SO 30 TIMES 100, AGAIN, WOULD BE
17 3,000. AND HIS WAS 1.5 CENTIMETERS. SO THAT WE'LL JUST SAY,
18 SAY, 33 DOUBLINGS -- 33 DOUBLINGS TIMES 100 WOULD BE 3,300
19 DAYS. TEN YEARS PROBABLY WOULD BE A GOOD NUMBER. AND SO
20 THAT WOULD BE IN 1989. 1989 WOULD BE PROBABLY WHEN THE FIRST
21 CANCER'S FORMED THAT STARTED TO PROLIFERATE TO FORM THAT
22 MASS.
23 Q. OKAY. SO WOULD IT BE -- WOULD YOU TELL ME --
24 IF THAT'S TRUE, WOULD THAT MEAN THAT IN 1989, HE ALREADY HAD
25 LUNG CANCER?
26 A. SURE. THAT'S EXACTLY RIGHT.
27 AND THAT'S WHAT'S NOW BEING DONE BY SOME
28 STUDIES NOW THAT THEY ARE TRYING TO DO ON PEOPLE THAT ARE
2864
1 SMOKERS; TO TRY TO DETECT EARLY CANCERS.
2 AND THERE'S BEEN TWO APPROACHES. ONE WOULD BE
3 WHAT'S CALLED SPIRAL CT SCANS TO TRY TO DETECT EARLY CANCER.
4 BUT ANOTHER ONE IS FROM THE MOLECULAR BIOLOGY, AND THAT IS TO
5 TRY TO GET A SAMPLE OF SPUTUM OR A SECRETION FROM DEEP IN THE
6 LUNG TO SEE IF YOU CAN DETECT THE EARLY GENETIC CHANGES IN
7 CELLS THAT WILL EVENTUALLY GIVE RISE TO CANCER.
8 AND IF YOU CAN, THEN, SOMEHOW VERY CAREFULLY
9 FOLLOW THOSE PEOPLE IN ANY WAY YOU CAN TO DETECT, SAY, AN
10 EARLY LUNG CANCER THAT CAN BE SURGICALLY TREATED AND CAN,
11 HOPEFULLY, BE CURED.
12 Q. THANK YOU.
13 NOW, YOU TALKED ABOUT CANCER -- WE TALKED ABOUT
14 LUNG CANCER. LET'S TALK ABOUT SOME TYPES OF LUNG CANCER.
15 ARE YOU READY TO DO THAT?
16 A. SURE.
17 Q. FOR OPENERS, ARE THERE TWO MAJOR SORT OF
18 CLASSIFICATIONS; SMALL CELL, LARGE CELL?
19 A. THERE ARE USUALLY A SMALL CELL AND NON-SMALL
20 CELL.
21 Q. EXCUSE ME. I'VE SPENT ZERO DAYS AS A
22 PATHOLOGIST.
23 A. THE REASON THAT THERE'S THAT CLASSIFICATION IS
24 VERY, VERY SIMPLE.

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SMALL CELL LUNG CANCER IS NOT A SURGICALLY TREATED DISEASE. IT'S TREATED WITH COMBINING THINGS LIKE CHEMOTHERAPY AND RADIATION THERAPY. VERY SPECIFIC TREATMENT. IT WILL DEPEND ON WHETHER IT'S CALLED A LOCALIZED DISEASE OR

2865

EXTENSIVE DISEASE.
NON-SMALL CELL CANCER IS EVERYTHING ELSE. AND THAT ALSO HAS SOME FAIRLY WELL-DEFINED TREATMENT, BUT IT'S BASICALLY ALL THE SAME FOR ALL OF THEM WITH THE EXCEPTION THAT MAYBE IF A PATIENT HAD A TYPE OF CANCER CALLED SQUAMOUS, S-Q-U-A-M-O-U-S, TYPE CANCER, WHICH IS USUALLY IN THE CENTER PART OF THE LUNG HERE, THAT MIGHT BE TREATED WITH RADIATION ONLY. ANYTHING ELSE IS BASICALLY GOING TO GET CHEMO, AND SOME INSTANCES, RADIATION, DEPENDING ON WHAT THE ANATOMIC STAGE OF THE DISEASE WILL BE.
Q. THANK YOU.
LET ME BACK YOU UP JUST A BIT.
SMALL CELL AND NON-SMALL CELL ARE THE TWO MAJOR CATEGORIES.
DID MR. BOEKEN HAVE SMALL CELL OR NON-SMALL CELL?
A. NON-SMALL CELL.
Q. WE CAN FORGET ABOUT SMALL CELL, THEN, RIGHT?
A. YES.
Q. OKAY. WHEN WE GET TO NON-SMALL CELL, ARE THERE DIFFERENT SUBCATEGORIES OF NON-SMALL CELL LUNG CANCER?
A. THREE MAJOR SUBCATEGORIES.
Q. PLEASE.
A. ADENOCARCINOMA IS THE MOST COMMON. NEXT MOST COMMON WOULD BE SQUAMOUS CARCINOMA. AND THE LEAST COMMON WOULD BE WHAT'S CALLED LARGE-CELL UNDIFFERENTIATED CARCINOMA.
Q. WHEN YOU SAY ADENOCARCINOMA IS THE MOST COMMON,

2866

GIVE US AN IDEA IN PERCENTAGES, COULD YOU, PLEASE?
A. AT THIS POINT IN TIME, PROBABLY 40 OR 45 PERCENT OF ALL LUNG CANCER.
Q. AND OF THE LUNG CANCERS, WE ALREADY GOT RID OF NON-SMALL CELLS.
HAVING GOT RID OF THOSE, WHAT PERCENTAGE OF THE SMALL CELL LUNG CANCERS ARE ABNORMAL?
A. ZERO. SMALL CELLS, BY DEFINITION, IS A VERY SPECIFIC TYPE OF CANCER, WHICH IS DERIVED FROM WHAT'S CALLED A NEUROENDOCRINE CELL THAT PRODUCES A LOT OF DIFFERENT HORMONES AND GROWTH FACTORS. IT'S A TUMOR THAT HAS GOT THE FASTEST GROWTH RATE. SOME OF THEM HAVE DOUBLED EVERY THREE DAYS. IT'S A TUMOR THAT CAN CAUSE ALL KINDS OF VERY FAST, BAD THINGS TO HAPPEN TO YOU.
Q. I MISSPOKE. WHAT I MEANT TO SAY IS: WHAT PERCENTAGE OF NON-SMALL CELL LUNG CANCERS ARE ABNORMAL?
A. OH, OKAY. NON-SMALL CELL.
AGAIN, IT WOULD BE IN THE NEIGHBORHOOD OF 40 TO 45 PERCENT.
Q. FINE. THANK YOU.
WHAT DID MR. BOEKEN HAVE?
A. HE HAD ADENOCARCINOMA.
Q. IS THERE SOME SORT OF A DEFINITION THAT SPECIALISTS LIKE YOU USE TO SAY THIS TUMOR FITS IN THIS SLOT AND THIS TUMOR FITS IN THIS SLOT AND THIS TUMOR FITS IN THIS SLOT?
A. SURE.
Q. WHAT'S THE DEFINITION FOR ADENOCARCINOMA,

2867

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PLEASE?
A. AN ADENOCARCINOMA IS A TYPE OF CANCER, AND IT CAN APPLY TO THE LUNG OR ANYWHERE IN WHICH THE CELLS ARE FORMING WHAT ARE CALLED GLANDULAR OR TUBULAR STRUCTURES, WHICH ARE LITTLE ROUND STRUCTURES HERE. AND THEY USUALLY SECRETE SUBSTANCES, OR THE OTHER CRITERIA IS THAT THEY PRODUCE MUCOUS, AND THOSE ARE THE TWO PRIMARY CRITERIA FOR DIAGNOSING ADENOCARCINOMA, BASICALLY, ANYWHERE IN THE BODY.
Q. SO WE'VE GONE CANCER, LUNG CANCER, NON-SMALL CELL CANCER, ADENOCARCINOMA?
A. RIGHT.
Q. ARE THERE SUBGROUPS OF THAT, TOO?
A. THERE ARE. THERE'S SEVERAL SUBGROUPS OF ADENOCARCINOMA IN THE LUNG. FOR EXAMPLE -- AND THAT'S KIND OF WHAT I KNOW AS A PATHOLOGIST. ALTHOUGH, FROM A PRACTICAL POINT OF VIEW, IT DOESN'T MAKE MUCH DIFFERENCE.
Q. LET'S STAY WITH THAT FOR A SECOND.
WHEN YOU SAY, FOR PRACTICAL -- OR FROM A PRACTICAL STANDPOINT, IT DOESN'T MAKE MUCH DIFFERENCE, WHAT DO YOU MEAN?
A. I MEAN THAT IF YOU LOOK AT WHAT HAPPENS TO PEOPLE THAT ARE, SAY, DIAGNOSED WITH ADENOCARCINOMA, MAYBE BY A TRANSBRONCHIAL BIOPSY OR A PURE CUTANEOUS NEEDLE BIOPSY, THE TREATMENT IS BASICALLY THE SAME.
AND THE INITIAL TREATMENT WOULD BE TO DETERMINE WHETHER THERE IS ANY EVIDENCE OF METASTASIS FROM THE PRIMARY SOURCE TO A DISTANT SOURCE. AND IF THERE ARE NO METASTASES, THE NEXT CONSIDERATION WOULD BE TO DETERMINE IF THE PERSON

2868

WAS AN OPERATIVE CANDIDATE. DID THE PERSON HAVE ENOUGH PULMONARY RESERVE TO UNDERGO A RESECTION OF THE LUNG.
Q. "RESECTION," MEANING?
A. CUT OUT THE PART OF THE LUNG WHERE THE TUMOR WAS.
Q. OKAY.
A. AND THE NEXT THING WOULD BE TO -- SOMETIMES, THEY'LL DO A BUNCH OF SOPHISTICATED SCANS, WHICH IS ANOTHER WAY OF STAGING, WHICH THEY'LL DETERMINE, BY WHAT'S CALLED A PET SCAN -- P-E-T, CAPITALIZED -- WHETHER OR NOT THERE'S ANY ACTIVITY IN AREAS THAT YOU MIGHT NOT BE ABLE TO SEE WITH SOME ORDINARY RADIOGRAPHIC TECHNIQUES, AND THEY CAN THEN -- THE NEXT PROCEDURE WOULD USUALLY BE TO TAKE THE PERSON TO THE OPERATING ROOM AND EITHER DO WHAT'S CALLED AN ARTHROSCOPIC PROCEDURE OR THORACOTOMY.
IN AN ARTHROSCOPIC PROCEDURE, THERE'S -- LIMITED TYPE OF INCISIONS ARE MADE, AND YOU CAN DO THINGS THROUGH WHAT'S CALLED AN ARTHROSCOPE.
IN THE THORACOTOMY, YOU WOULD ACTUALLY OPEN UP THE PATIENT AND GET INSIDE OF THE CHEST. FREQUENTLY, THAT IS PRECEDED BY WHAT'S CALLED A MEDIASTINOSCOPY, IN WHICH YOU PUT A TUBE RIGHT UNDERNEATH THE BREAST BONE HERE AND GO DOWN UNDERNEATH THE STERNUM, AND YOU PLUCK LYMPH NODES OUT FROM THAT AREA. AND YOU WOULD SEND THOSE TO A PATHOLOGIST, LIKE MYSELF, TO SEE WHETHER THERE'S ANY METASTATIC CANCER.
IF THERE WAS METASTATIC CANCER, THE SURGERY WOULD BE TERMINATED. IF THERE WAS NOT, THEN THE PERSON WOULD GO TO THORACOSCOPY OR THORACOTOMY, AND THE TUMOR WOULD BE

2869

RESECTED. USUALLY, IF IT WAS NOT INVOLVING WHAT'S CALLED THE HILUM OF THE LUNG, IT WOULD BE RESECTED JUST WITH WHAT LOBE IT WAS IN.
LIKE IF IT WAS IN THE RIGHT UPPER LOBE, LIKE MR. BOSKY -- NOT ABOUT MR. BOSKY -- MR. BOEKEN, IT WOULD BE

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6 RESECTED, IN WHICH THE ENTIRE RIGHT UPPER LOBE WOULD BE
7 REMOVED WITH THE TUMOR.
8 IF THE TUMOR WAS AT THE HILUM, BUT THERE'S
9 STILL A MARGIN, THEY MIGHT TAKE OUT THE ENTIRE RIGHT LUNG.
10 Q. WHAT'S THE HILUM?
11 IS THAT LIKE THE DIFFERENCE BETWEEN
12 SAN FRANCISCO AND LOS ANGELES, RIGHT DOWN THE MIDDLE THERE?
13 A. IT'S RIGHT -- IF YOU'D TURN THAT THING AROUND.
14 IT'S RIGHT -- YOU CAN SEE THERE WHERE THE TUBE COMES DOWN
15 WHERE IT SAYS THE TRACHEA, AND THEN IT GOES INTO ONE TUBE ON
16 THE ONE SIDE AND ONE ON THE OTHER. WHERE THAT TUBE ENTERS
17 THE LUNG IS CALLED THE HILUM.
18 Q. RIGHT THERE?
19 A. RIGHT THERE. YEAH.
20 IF THERE'S A TUMOR THERE THAT WAS CLOSE TO
21 THAT, BUT YET THEY COULD GET A MARGIN, THEY COULD CUT OFF
22 ENOUGH OF THAT BRONCHUS WITHOUT HAVING TO GET TO THE TRACHEA,
23 AND THEY COULD GET A STAPLE ACROSS IT, THEY COULD TAKE OUT A
24 TUMOR BY CUTTING IT THERE AND TAKING OUT THE ENTIRE LUNG.
25 IN MR. BOEKEN'S CASE, ALL THEY HAD TO DO WAS
26 TAKE OUT THE MASS IN THE RIGHT UPPER LOBE AND THEN RESECT THE
27 REST OF THE LOBE.
28 Q. THANK YOU.
2870
1 AS PART OF THAT ANSWER, ONE OF THE THINGS YOU
2 SAID IS LYMPH NODES ARE TAKEN, SENT TO A DOCTOR LIKE YOU, AND
3 IF THERE'S NO METASTATIC DISEASE, THEN THE SURGERY CAN GO.
4 WHAT IF THERE IS METASTATIC DISEASE?
5 A. IF THERE'S METASTATIC DISEASE, THEN THE TUMOR
6 WOULD BE CONSIDERED, AS TO THE LYMPH NODE, AS N-2 DISEASE,
7 WHICH THERE IS MEDIASTINAL LYMPH NODES, AND THAT WOULD BE A
8 CONTRAINDICATION TO DO ANY FURTHER SURGERY BECAUSE WHAT'S
9 BEEN FOUND IS, IF YOU HAVE METASTASES TO THOSE LYMPH NODES,
10 SURGERY DOESN'T BENEFIT SURVIVAL.
11 Q. IN OTHER WORDS, IF IT'S ALREADY METASTASIZED TO
12 THOSE LYMPH NODES, YOU'RE CLOSING THE BARN DOOR AFTER THE
13 HORSE OR COW OR WHATEVER HAS GONE?
14 A. THAT'S RIGHT.
15 Q. THANKS.
16 NOW, HERE'S HOW WE GOT INTO THAT SUBJECT. I
17 WAS ASKING YOU ABOUT SUBCATEGORIES OF ADENOCARCINOMA OF THE
18 LUNG, AND I THINK YOU STARTED OUT IN YOUR ANSWER BY SAYING IT
19 DOESN'T REALLY MATTER IN TREATMENT, BUT TO PEOPLE LIKE YOU,
20 IT MIGHT MATTER.
21 DID YOU SAY THAT?
22 A. I DID SAY THAT.
23 Q. WHAT DO YOU MEAN BY THAT, PLEASE?
24 A. I MEAN, PATHOLOGISTS LOVE TO LOOK AT CANCERS
25 AND LOVE TO LOOK AT CELLS, AND THAT'S KIND OF WHAT WE DO FOR
26 A LIVING. AND WHAT WE LIKE TO DO IS SUBCLASSIFY EVERYTHING
27 ACCORDING TO THE APPEARANCE OF THE CANCER CELLS AND THE
28 VARIOUS TYPES OF STRUCTURES THEY FORM.
2871
1 SO IN THE CASE OF LUNG CANCER, THERE ARE FOUR
2 MAJOR SUBTYPES. THERE'S PAPILLARY ADENOCARCINOMA; THERE'S A
3 BRONCHIOLOALVEOLAR CELL CARCINOMA; THERE IS ACINAR
4 ADENOCARCINOMA OF THE LUNG; AND THERE IS WHAT'S CALLED A
5 SOLID ADENOCARCINOMA OF THE LUNG, WHICH IS DEFINED AS ONE
6 WHERE THE GROWTH PATTERN IS COMPOSED OF CELLS THAT ARE IN A
7 SOLID SHEET, BUT YOU CAN IDENTIFY MUCUS PRODUCTION BY THOSE
8 CELLS.
9 Q. IS THERE SOME OFFICIAL PLACE -- IF I WANTED TO
10 LOOK UP A LEGAL TERM, I GUESS I COULD FIGURE OUT WHERE TO GO

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TO LOOK UP LEGAL TERMS -- TO LOOK UP DEFINITIONS OF THESE
TYPES OF CANCERS?
IS THERE A PLACE TO GO?
A. SURE.
Q. WHERE?
A. YOU COULD GO TO THE WORLD HEALTH ORGANIZATION
CLASSIFICATION OF LUNG CANCERS AND MESOTHELIOMAS. OR GO TO A
BOOK LIKE MINE WHICH WOULD HAVE THE LAST WHO CLASSIFICATION
IN IT PRIOR TO THE MORE CURRENT ONE. THAT WOULD BE THE MOST
FREQUENT PLACES TO LOOK.
YOU COULD PROBABLY ALSO GO TO A CANCER MEDICINE
TEXTBOOK AND FIND CLASSIFICATION OF LUNG CANCER THERE, WHICH
MAY NOT BE AS DETAILED AS A PATHOLOGY BOOK.
Q. THANK YOU.
I WANT TO TALK MORE ABOUT YOUR QUALIFICATIONS
NOW, AND I HOPE I ASK THE RIGHT QUESTIONS.
LET'S START WITH THE WHO. WHAT IS THE WHO?
A. IT STANDS FOR THE WORLD HEALTH ORGANIZATION.

2872

Q. WHEN IS THE LAST TIME THAT THE WORLD HEALTH
ORGANIZATION CLASSIFIED THE SUBTYPES OF ADENOCARCINOMA?
A. PRIOR TO THE MOST RECENT ONE, IT WOULD BE 1981.
Q. WHEN WAS THE MOST RECENT ONE?
A. 1999.
Q. DID YOU HAVE SOMETHING TO DO WITH THE WORLD
HEALTH ORGANIZATION'S EFFORTS TO CLASSIFY SUBTYPES OF
ADENOCARCINOMA IN 1999?
A. YES.
Q. TELL US WHAT, PLEASE?
A. I WAS A MEMBER OF A PANEL OF PATHOLOGISTS FROM
VARIOUS COUNTRIES IN THE WORLD THAT MET OVER ABOUT A
THREE-YEAR PERIOD TO HASH OUT THE MOST RECENT CLASSIFICATION.
Q. NOW, UNDER THE MOST RECENT CLASSIFICATION, WHAT
IS MR. BOEKEN'S DIAGNOSIS -- NOT JUST CANCER, AND NOT JUST
LUNG CANCER, OR NOT JUST ADENOCARCINOMA -- BUT WHAT ARE THE
SUBCLASSIFICATIONS?
A. HE WOULD HAVE ADENOCARCINOMA WITH AREAS OF
PAPILLARY DIFFERENTIATION, AREAS OF BRONCHIOLOALVEOLAR CELL
GROWTH MATTER AND THE METASTASIS, A SOLID GROWTH PATTERN, A
SIGNET-RING TYPE OF FORMATION.
Q. THAT'S A MOUTHFUL.
A. YEAH.
Q. IT SOUNDS LIKE HIS ADENOCARCINOMA HAD A LITTLE
BIT OF ALL THE SUBTYPES?
A. IT DID. I FORGOT, HIS ALSO HAS ACINAR
DIFFERENTIATION.
Q. IS IT COMMON OR UNCOMMON FOR ADENOCARCINOMA OF

2873

THE LUNG TO HAVE A MIX OF DIFFERENT SUBCLASSIFICATIONS?
A. IT'S VERY COMMON. THAT'S WHAT YOU SEE IN THE
VAST MAJORITY OF THEM.
Q. THAT'S NOT WHAT I SEE IN ANY.
IS THAT WHAT YOU SEE IN THE VAST MAJORITY?
A. THAT'S WHAT I SEE IN MOST OF THEM.
Q. AS FAR AS THE LITERATURE IS CONCERNED,
INCLUDING THE WORLD HEALTH ORGANIZATION CLASSIFICATIONS, IS
THAT WHAT THOSE SPECIALISTS SEE, TOO?
A. YES. IF YOU LOOK AT THE SECTION IN THE WHO
BOOK, IT WILL SAY EXACTLY THAT; THAT MOST ADENOCARCINOMA SHOW
VARIOUS PATTERNS OF DIFFERENTIATION.
Q. ALL RIGHT. THANK YOU.
WE MAY BE HEARING LATER IN THE TRIAL SOMETHING
ABOUT A FASCICLE.

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16 DO YOU KNOW WHAT A FASCICLE IS?
17 A. YES.
18 Q. CAN YOU SPELL IT FOR THE COURT REPORTER?
19 A. YES. F-A-S-C-I-C-L-E.
20 Q. WHAT IS IT?
21 A. WELL, PATHOLOGISTS, WHEN THEY HEAR THE WORD
22 FASCICLE -- AND IT PROBABLY HAS A VERY DISTINCT
23 DEFINITION -- BUT IT REFERS TO A PUBLICATION BY THE ARMED
24 FORCES INSTITUTE OF PATHOLOGY, WHICH IS KIND OF A WORLD
25 FAMOUS PATHOLOGY INSTITUTE THAT OVER THE YEARS HAD PRODUCED
26 THESE DOCUMENTS WHICH ARE IN THE FORM OF BOOKS, BUT THEY'RE
27 USUALLY LOOSE-LEAF, AND THEY'RE USUALLY MORE LIKE PAPER SIZE,
28 SAY, 11 BY -- OH, WHATEVER THE SIZE OF A STANDARD -- THIS
2874
1 SIZE RIGHT HERE.
2 AND WHAT THEY DO, THEY ARE WRITTEN BY PEOPLE
3 WHO ARE CONSIDERED EXPERTS IN THE AREA AND THEY ARE WRITTEN
4 ABOUT CERTAIN TYPES OF TUMORS. FOR EXAMPLE, THERE'S ONE ON
5 LUNG CANCERS. THERE'S ONE ON MESOTHELIOMA. THERE'S ONE ON
6 CANCER OF THE KIDNEY. THERE'S ONE ON CANCER OF THE HEAD AND
7 NECK. ONE IS SOFT TISSUE CANCERS. BASICALLY, EVERYTHING YOU
8 CAN THINK OF. AND THOSE PUBLICATIONS ARE USED WORLDWIDE BY
9 PATHOLOGISTS TO HELP THEM IN THEIR DAILY WORK OF CLASSIFYING
10 TUMORS.
11 Q. THANK YOU.
12 NOW, I'M INTERESTED -- THIS IS THE U.S. ARMED
13 FORCES FASCICLE?
14 A. YES.
15 Q. I'M INTERESTED, OBVIOUSLY, IN ANY ON LUNG
16 CANCER HERE.
17 ARE YOU FAMILIAR WITH THE U.S. ARMED FORCES
18 FASCICLES ON LUNG CANCER?
19 A. SURE.
20 Q. WHO WROTE THOSE?
21 A. THERE'S ONLY ONE. THE MOST CURRENT ONE WAS
22 WRITTEN BY THREE FRIENDS OF MINE. BILL TRAVIS IS AT THE
23 AIFP. MICHAEL KOSS -- T-R-A-V-I-S -- MICHAEL KOSS, K-O-S-S,
24 WHO NOW IS A PATHOLOGIST HERE WORKING IN LOS ANGELES. HIS
25 WIFE IS A MICROBIOLOGIST. AND THE OTHER WRITER, AUTHOR, WAS
26 A PERSON BY THE NAME OF THOMAS COLBY, C-O-L-B-Y, AND
27 DR. COLBY IS A PATHOLOGIST AT THE MAYO CLINIC IN
28 SCOTTSDALE, ARIZONA.
2875
1 Q. I WANT TO TALK ABOUT TWO OF THE THREE.
2 AS FAR AS DR. TRAVIS IS -- WELL, LET'S TALK
3 ABOUT DR. COLBY FIRST.
4 HAVE YOU AND DR. COLBY WRITTEN OR EDITED
5 TOGETHER?
6 A. YES.
7 Q. WHAT WOULD THAT BE, PLEASE?
8 A. WE WROTE A BOOK THAT I HAVE HERE. IT'S CALLED,
9 "PULMONARY PATHOLOGY TUMORS," WHICH IS A BOOK ON THE TUMORS
10 OF THE LUNG. AND DR. COLBY, MYSELF AND A DR. DAVID DAIL,
11 D-A-I-L, WERE THE EDITORS OF THAT BOOK AND AUTHORS.
12 Q. SO THIS?
13 A. YES.
14 Q. OKAY. SO OF THE THREE AUTHORS HERE, I JUST
15 WANT TO CONCENTRATE -- NO OFFENSE TO DR. DAIL.
16 A. OKAY.
17 Q. I JUST WANT TO CONCENTRATE ON TWO FOR NOW.
18 YOU'RE HAMMER. COLBY IS ONE OF THE PEOPLE THAT
19 WROTE THE ARMED FORCES FASCICLE ON LUNG CANCER?
20 A. YES.

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Q. OKAY. DID YOU AND DR. COLBY ALSO SERVE TOGETHER ON A U.S. AND CANADIAN EFFORT THAT HAD SOMETHING TO DO WITH CANCER?
A. YES.
Q. TELL US WHAT THE EFFORT WAS AND WHAT IT IS THAT THE TWO OF YOU DO, PLEASE?
A. WELL, DR. COLBY AND I HAVE SERVED ON A U.S. AND CANADIAN MESOTHELIOMA PANEL WHICH IS A PANEL THAT REVIEWS

2876

SUSPECT CASES OF MESOTHELIOMA AT NO CHARGE FOR OTHER PATHOLOGISTS.
AND DR. COLBY AND I WERE BOTH ON THE INTERNATIONAL GROUP OF PATHOLOGISTS THAT SERVE TO WRITE THE CURRENT WHO CLASSIFICATION OF LUNG CANCER.
Q. NOW, WERE YOU ANSWERING AS TO DR. COLBY JUST THEN?
A. YES.
Q. BECAUSE I WAS THINKING AHEAD. THANK YOU.
DR. TRAVIS. DID YOU ALSO SERVE WITH DR. TRAVIS ON THE SAME U.S./CANADIAN PANEL DEALING WITH MESOTHELIOMA?
A. YES. HE'S A MEMBER OF THAT PANEL, ALSO.
Q. DO YOU AND DR. TRAVIS HAVE SOMETHING IN COMMON AS FAR AS ANOTHER ORGANIZATION THAT THE JURY SHOULD HEAR ABOUT?
A. YES.
Q. WHAT IS THAT, PLEASE?
A. THE PULMONARY PATHOLOGY SOCIETY.
Q. WHAT DO YOU HAVE IN COMMON WITH THEM?
A. THE PULMONARY PATHOLOGY SOCIETY IS AN INTERNATIONAL SOCIETY DEVOTED TO THE STUDY OF LUNG DISEASES FROM A PATHOLOGIST'S PERSPECTIVE. AND WHEN IT WAS FIRST FORMED, DR. COLBY WAS THE PRESIDENT, I WAS THE VICE-PRESIDENT, DR. TRAVIS WAS THE SECRETARY. SO WE BOTH HAVE BEEN IN THE EXECUTIVE BRANCH, SO TO SPEAK, OF THAT ORGANIZATION.
Q. DID YOU EVER GET TO BE PRESIDENT OF IT?
A. I DID.

2877

Q. YOU'RE FAMILIAR WITH THE U.S. ARMED FORCES FASCICLE ON LUNG CANCER?
A. YES.
Q. AS FAR AS THOSE DOCUMENTS ARE CONCERNED, USING THE DEFINITION THERE, WHAT KIND OF ADENOCARCINOMA DOES MR. BOEKEN HAVE?
A. HE WOULD HAVE ADENOCARCINOMA OF THE MIX-CELL TYPE OR SHOWING VARIABLE DIFFERENTIATION.
Q. NOW, WHY DID THE WORLD HEALTH ORGANIZATION RECLASSIFY LUNG TUMORS IN 1999 AFTER ALREADY HAVING DONE IT ONCE IN 1981?
A. WELL, BECAUSE THERE ARE CERTAIN CHANGES, AND THE CHANGES, PROBABLY IN THE AREA OF ADENOCARCINOMA, AND THE OTHER CHANGE WOULD BE PRIMARILY IN THE GROUP OF TUMORS OF THE LUNG REFERRED TO AS NEUROENDOCRINE TUMORS, ESPECIALLY THREE NEW TUMORS OR TWO NEW ENTITIES THAT HAD NOT BEEN PREVIOUSLY DESCRIBED.
ONE WAS CALLED A LARGE-CELL NEUROENDOCRINE CARCINOMA. AND THE OTHER IS CALLED AN ATYPICAL CARCINOMA. AND THE REASON THAT THAT WAS DEFINED IS, A LOT OF PATHOLOGISTS DIDN'T UNDERSTAND WHAT THOSE ENTITIES WERE, AND THIS HAS BEEN SOMETHING THAT HAS BEEN PUBLISHED SINCE 1981 AND, ACTUALLY, HAS BEEN PUBLISHED ONLY ABOUT THE LAST FIVE TO SIX YEARS.
Q. NOW, DO YOU HAVE -- DO YOU HAVE SOME SLIDES

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26 THAT WE CAN TAKE A LOOK AT THAT YOU CAN SHOW THE JURY AND
27 DISCUSS MR. BOEKEN'S TUMOR?
28 A. I DO.
2878
1 Q. BEFORE YOU DO, I WANT TO SHOW ONE MORE THING, I
2 GUESS.
3 HERE'S A PAGE OR, ACTUALLY, PART OF A PAGE FROM
4 A THREE-PAGE -- I THINK IT'S THREE -- PATHOLOGY REPORT FROM
5 CEDARS-SINAI HOSPITAL.
6 ARE YOU FAMILIAR WITH THAT REPORT?
7 A. YES.
8 Q. THE DIAGNOSIS HERE, IT SAYS (READING):
9
10 "RIGHT UPPER LOBE WEDGE
11 RESECTION.
12 "PAPILLARY ADENOCARCINOMA OF
13 THE LUNG.
14 "MODERATELY
15 WELL-DIFFERENTIATED."
16
17 WHAT DOES "MODERATELY WELL-DIFFERENTIATED"
18 MEAN, PLEASE?
19 A. CANCERS ARE CLASSIFIED BY THE BEST
20 DIFFERENTIATED AREA AND ARE GRADED BY THE WORST. AND THE
21 MODERATELY WELL-DIFFERENTIATED REFERS TO HOW CLOSELY THE
22 CANCER CELLS RESEMBLE NORMAL CELLS.
23 IF YOU USE THE WORD "WELL-DIFFERENTIATED," THAT
24 WOULD MEAN THAT THE CANCER CELLS FAIRLY CLOSELY RESEMBLE THE
25 NORMAL CELLS FROM WHICH THEY ORIGINATED. IF YOU USE THE
26 ADJECTIVE POORLY DIFFERENTIATED, IT WOULD INDICATE THAT THE
27 CANCER CELLS DID NOT VERY CLOSELY RESEMBLE THE NORMAL CELLS
28 OF THE LUNG, BUT THERE WAS STILL EVIDENCE OF GLANDULAR
2879
1 DIFFERENTIATIONS WHICH ALLOWED YOU TO MAKE THE DIAGNOSIS OF
2 ADENOCARCINOMA.
3 IN THIS CASE, THEY USE THE ADJECTIVE
4 "MODERATELY WELL," WHICH MEANS THAT IT'S KIND OF IN BETWEEN
5 MODERATELY DIFFERENTIATED, WHICH STILL LOOKS KIND OF LIKE A
6 NORMAL CANCER CELL, BUT THERE'S SOME CELLS THAT DON'T, AND
7 WELL-DIFFERENTIATED, WHICH MEANS THAT, YEAH, MOST OF THE
8 CANCER CELLS LOOK LIKE NORMAL CELLS FROM WHICH THEY AROSE.
9 Q. THANKS.
10 NEXT (READING):
11
12 "MAX NUMBER TUMOR
13 DIFFERENTIATION, 1.5 CENTIMETERS."
14
15 I GUESS WE'VE ALREADY TALKED ABOUT THAT. BUT
16 LET ME JUST ASK YOU. ARE THERE OTHER PLACES IN THE RECORDS
17 WHERE SOME PEOPLE THINK IT'S A LITTLE BIT LARGER?
18 A. RADIOGRAPHICALLY, THEY DO. IT REALLY DOESN'T
19 MAKE ANY DIFFERENCE. BECAUSE THE REASON THAT IS IMPORTANT IS
20 WHEN YOU DO WHAT'S CALLED THE ANATOMIC STAGING -- AND THAT IS
21 THE SINGLE MOST IMPORTANT THING IN DETERMINING THE PROGNOSIS
22 OF A PATIENT. AND THAT'S DONE IN WHAT'S CALLED A TN&M
23 SYSTEM. "T" STANDS FOR TUMOR SIZE; "N" STANDS FOR LYMPH NODE
24 METASTASIS OR LACK THEREOF; AND "M" STANDS FOR DISTANT
25 METASTASES.
26 SO ANY TUMOR THAT'S LESS THAN 3 CENTIMETERS IN
27 DIAMETER OR GOLF BALL SIZE, THAT WOULD BE THE T-1 LESION. IN
28 MR. BOEKEN'S CASE, IF IT WAS 1.5 OR 2.3, IT WOULD STILL BE A
2880
1 T-1.

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SO IT REALLY DOESN'T MAKE A DIFFERENCE, FROM ANATOMIC STAGING, WHICH WOULD DETERMINE HIS PROGNOSIS AND ALSO WOULD BE DETERMINING HIS TREATMENT, IF YOU JUST WENT ON THE INITIAL RADIOGRAPHIC APPEARANCE.
Q. THANK YOU.
NEXT (READING):

"RESECTION MARGINS ARE CLEAR."

HAVE YOU GOT AN IDEA -- MOST OF US HAVE AN IDEA WHAT THAT MEANS, BUT WHAT DOES THAT MEAN MEDICALLY?
A. OKAY. THAT JUST MEANS, IS THAT THEY TOOK OUT ENOUGH OF LUNG TISSUE THAT COMPLETELY SURROUNDED THE TUMOR WHERE THERE WASN'T ANY CANCER.
AND THE REASON THAT'S IMPORTANT IS THAT IF YOU HAD A TUMOR THAT WAS EXTENDING TO ONE OF THE MARGINS, YOU WOULD HAVE STILL LEFT SOME CANCER IN THERE, WHICH IS NOT WHAT YOU WANT TO DO. SO THE PATHOLOGIST SAID THAT THE RESECTION MARGINS -- THAT WOULD MEAN ALL OF THE TISSUE WHICH THEY CUT OUT -- THAT THERE WAS NO CANCER THAT EXTENDED TO THAT TISSUE.
Q. SO SORT OF LIKE A FIRE BREAK OR SOMETHING LIKE THAT?
A. SURE.
Q. LAST (READING):

"SURROUNDING LUNG SHOWS MILD CONGESTION WITH INTRAALVEOLAR HISTIOCYTE" --

2881

A. YEAH. HISTIOCYTE.
Q. (READING:)

"SOME OF WHICH CONTAIN HEMOSIDERIN," PAREN, "('HEART FAILURE CELLS).'"

NOW, DO YOU AGREE WITH ALL OF THAT PART?
A. NOT ALL OF IT. PART OF IT.
Q. WHAT PART DO YOU AGREE?
A. I AGREE THAT THERE WERE HISTIOCYTES PRESENT ONLY. "HISTIO" MEANS TISSUE; "CYTES" MEANS CELLS. TISSUE CELLS. AND THEY ARE SYNONYMOUS WITH A CELL CALLED MACROPHAGES, WHICH COMES FROM THE BONE MARROW THAT GETS INTO YOUR TISSUE AND DOES ALL KINDS OF NEAT THINGS, LIKE PROTECTS YOU AGAINST INFECTIONS AND PROTECTS YOU AGAINST FOREIGN MATERIAL.
SO I AGREE THAT THERE ARE HISTIOCYTE PRESENT.
I ALSO AGREE THAT THERE'S HEMOSIDERIN IN THEM, BUT I DON'T THINK THEY'RE HEART FAILURE CELLS, UNLESS THEY JUST USE THAT AS A SIMPLE ADJECTIVE TO DESCRIBE CELLS THAT OCCUR IN PEOPLE WITH CONGESTIVE HEART FAILURE THAT DO CONTAIN HEMOSIDERIN.
WHAT THEY'RE REALLY DESCRIBING THERE ARE SMOKERS' MACROPHAGES.
Q. WHY DON'T YOU THINK IT'S HEART FAILURE CELLS?
A. BECAUSE HE DIDN'T HAVE CONGESTIVE HEART FAILURE. THERE WAS NO EVIDENCE THAT HE EVER HAD CONGESTIVE HEART FAILURE.

2882

Q. NO CONGESTIVE HEART FAILURE?
NO CONGESTIVE HEART FAILURE?
A. YEAH. AND THE OTHER THING IS, IF YOU LOOK AT SIGNIFICANT CIGARETTE SMOKERS' MACROPHAGES AND YOU DO STAINS FOR IRON, IF YOU DO IRON STAINS AND LOOK AT THE MACROPHAGES THAT ARE PRESENT IN THE LUNGS OF CIGARETTE SMOKERS, YOU

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7 BASICALLY CAN IDENTIFY HEMOSIDERIN IN 100 PERCENT OF THEM.
8 Q. SO LET'S TALK -- BECAUSE I DON'T SEE THE WORD
9 UP THERE -- MACROPHAGES.
10 WHAT DOES THAT MEAN?
11 A. "PHAGES" MEANS ENGULF; AND "MACRO" MEANS LARGE.
12 SO IT'S A LARGE ENGULFING CELL, AND IT IS SYNONYMOUS WITH THE
13 WORD HISTIOCYTE, WHICH IS THE TISSUE CELL.
14 Q. SO WHAT'S THE DIFFERENCE BETWEEN -- EXCUSE
15 ME -- "MACROPHAGES" IS THE SAME AS THIS WORD HERE,
16 "HISTIOCYTE"?
17 A. YES. SYNONYMOUS.
18 Q. OKAY. SYNONYMOUS.
19 SO WHAT'S THE DIFFERENCE BETWEEN -- LET ME
20 SWITCH THE WORDS. INSTEAD OF SAYING SMOKERS' MACROPHAGE, LET
21 ME USE THAT WORD HISTIOCYTE.
22 WHAT'S THE DIFFERENCE BETWEEN A REGULAR OLD
23 HISTIOCYTE AND ONE HAVING TO DO WITH SMOKING?
24 A. WELL, WHAT HAPPENS IN SMOKERS IS THAT ABOUT A
25 THIRD OF THE SMOKE THEY INHALE INTO THEIR LUNGS IS
26 PARTICULATE MATTER. AND THAT IF YOU WERE ABLE TO WEIGH --
27 AND YOU ARE ABLE TO DO THIS -- THE WEIGHT OF THE SMOKE GOING
28 IN VERSUS THE SMOKE COMING OUT, IS THAT IT'S ABOUT A THIRD
2883
1 LESS HEAVY AS IT GOES OUT THAN IT WAS WHEN IT CAME IN.
2 AND THAT'S DUE TO THE PARTICULATE MATTER. AND
3 WHAT THE MACROPHAGES DO IS THEY SEE THAT PARTICULATE MATTER
4 AS A FOREIGN MATERIAL. AND MACROPHAGES DON'T LIKE FOREIGN
5 MATERIAL. SO THEY GO ALONG, LIKE PAC MAN, AND GRAB IT,
6 ENGULF IT, TAKE IT UP INTO HIS CYTOPLASM, AND THAT GIVES THE
7 CYTOPLASM OF THE CELL, WHICH IS THE MATERIAL AROUND THE
8 NUCLEUS, THIS TANNISH-BROWN APPEARANCE, AND IN THERE WILL BE
9 SOME IRON, WHICH IS THE HEMOSIDERIN.
10 Q. SO WHAT DO SMOKERS' MACROPHAGES LOOK LIKE
11 COMPARED TO OTHERS?
12 A. NORMAL MACROPHAGES WOULDN'T HAVE THIS
13 BROWNISH-TAN MATERIAL. THEY WOULD JUST USE THE USUAL DYES
14 THAT PATHOLOGISTS USE TO STAGE CELLS. THEY WOULD LOOK PINK
15 RATHER THAN BROWN.
16 Q. OKAY. SMOKERS' ARE BROWN AND TAN?
17 A. RIGHT.
18 Q. ALL RIGHT. PUT THIS DOWN TEMPORARILY.
19 ALL RIGHT. IT'S 2:30. DO YOU WANT TO SHOW US
20 A SLIDE, PLEASE.
21 A. SURE. I THINK THAT MACHINE THERE --
22 OKAY. GREAT.
23 THIS IS JUST A PART OF THE TUMOR THAT HAS BEEN
24 PHOTOGRAPHED, AS YOU LOOK AT IT, AT A FAIRLY HIGH
25 MAGNIFICATION. PROBABLY ABOUT 250 POWER.
26 AND WHAT IT SHOWS IS THE CANCER CELLS THAT ARE
27 FORMING VARIOUS PATTERNS. AND WITHOUT GETTING TOO DETAILED,
28 THERE'S SOME AREAS WHERE THE TUMOR HAS A PAPILLARY PATTERN
2884
1 THERE WHERE YOU HAVE THESE OUTPOUCHINGS OF THE CELLS INTO THE
2 AIR SPACES.
3 AND HERE'S JUST A HIGHER MAGNIFICATION OF THOSE
4 WHERE YOU CAN SEE, AGAIN, A LITTLE PAPILLARY OUTPOUCHING INTO
5 AIR SPACE. ALSO, YOU CAN SEE THE INDIVIDUAL CANCER CELLS.
6 Q. LET ME STOP YOU FOR A SECOND.
7 YOU CAN SEE A PAPILLARY OUTPOUCHING INTO
8 SOMETHING, BUT I CAN'T SEE IT.
9 A. YOU CAN'T. OKAY. CAN I --
10 THE COURT: PLEASE, SIR.
11 THE WITNESS: THIS IS A RELATIVELY HIGH-POWERED

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MAGNIFICATION OF THE TUMOR, JUST A SMALL AREA OF IT.
AND FIRST, I'LL JUST -- SO THESE ARE THE
INDIVIDUAL CANCER CELLS. AND CELLS ARE MADE UP OF NUCLEUS
THAT CONTAINS DNA, WHICH WOULD BE RIGHT HERE.
THEN THE PINK AROUND HERE, THAT'S THE
CYTOPLASM. EACH ONE OF THESE CANCER CELLS THAT WAS INITIALLY
DERIVED FROM A SINGLE CELL. AND IT'S FORMING HERE KIND OF A
GLANULAR STRUCTURE.
AND IN HERE, THERE'S SOME KIND OF A PAPILLARY
PROJECTION OF THESE CELLS IN HERE, INTO THIS SPACE HERE,
WHICH COULD WELL BE AN AIR SPACE.
AND THEN YOU HAVE SOME INCREASE IN WHAT'S
CALLED THE STROMAL TISSUE IN BETWEEN. THAT'S JUST ONE TYPE
OF AN ADENOCARCINOMA. THAT IS KIND OF SHOWING THIS PAPILLARY
PATTERN HERE.
THESE ARE AIR SPACES, WHICH IS KIND OF HARD TO
TELL ON THIS PHOTOGRAPH.
2885
THIS WOULD ALSO BE CONSISTENT WITH A
BRONCHIOLOALVEOLAR CELL GROWTH PATTERN.
Q. BY MR. PIUZE: LET'S STAY WITH THAT FOR A
SECOND. BECAUSE WE WANT TO TALK ABOUT THAT.
BRONCHIO -- WHAT'S -- SAY THE TERM AGAIN?
A. IT'S A BRONCHIOLOALVEOLAR,
B-R-O-N-C-H-I-O-L-O-A-L-V-E-O-L-A-R.
VERY SIMPLE. IT REALLY IS. IT'S -- IF YOU
THINK ABOUT YOUR LUNGS AND THE WAY YOU BREATHE, THE AIR COMES
INTO YOUR MOUTH, GOES DOWN THIS BIG TUBE CALLED A TRACHEA,
AND THEN IT GETS INTO THESE SMALLER BRANCHES. AND
EVENTUALLY, THESE BRANCHES GET SMALLER AND SMALLER AND
SMALLER, UNTIL THEY GET OUT TO AN AREA WHERE THE GAS
EXCHANGE OCCURS.
AND IF YOU REMEMBER FROM YOUR HIGH SCHOOL
BIOLOGY, IS THAT THE MAIN FUNCTION OF THE LUNGS IS TO
OXYGENATE THE BLOOD. AND HOW IT DOES THIS IS THAT THE AIR
COMES IN, WHICH IS 20 PERCENT OXYGEN, AND IS CARRIED THROUGH
THESE AIR TUBES, AND IT GETS WAY OUT TO THE OUTER PART OF THE
LUNG WHERE YOU HAVE AIR SACS. AND THESE AIR SACS ARE
SCIENTIFICALLY REFERRED TO AS ALVEOLI.
AND THE LITTLE TUBES THAT ARE RIGHT BEFORE THE
ALVEOLI ARE CALLED ALVEOLAR DUCTS. AND THEN THE STRUCTURES
RIGHT BEFORE THEM, WHICH ARE VERY, VERY TINY, ARE CALLED
BRONCHIALS. SO A BRONCHIOLOALVEOLAR CELL CARCINOMA MEANS A
CANCER OF CELLS DERIVED FROM THE BRONCHIALS AND/OR THE
ALVEOLI, AND THAT'S ALL IT MEANS.
AND THERE ARE TWO MAIN CELLS THAT THESE CANCERS
2886
ARE DERIVED FROM. ONE IS CALLED A CLARA CELL, CAPITAL,
C-L-A-R-A, WHICH IS NAMED AFTER A PERSON. AND THE OTHER IS
CALLED A TYPE II PNEUMOCYTE, P-N-E-U-M-O-C-Y-T-E. AND
"PNEUMO," AGAIN, MEANS AIR; "CYTE" IS A CELL, AN AIR CELL.
SO CANCERS THAT OCCUR IN THIS PART OF THE LUNG
THAT ARE CALLED BRONCHIOLOALVEOLAR CELL CARCINOMAS ARE
CANCERS THAT ARE DERIVED FROM THOSE CELLS THAT FREQUENTLY
GROW ALONG PRE EXISTING ALVEOLAR STRUCTURES, WHICH WOULD BE
THESE RIGHT HERE.
Q. YOU'RE RIGHT. IT WAS EASY.
A. IT REALLY IS.
Q. NOW, YOU SAID THERE WERE CERTAIN CELLS THERE
THAT COULD BE A I OR A II, RIGHT?
A. IT COULD BE A TYPE II PNEUMOCYTE OR A CLARA
CELL.
Q. OKAY. BEFORE WE GO TO THAT.

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17 WHEN YOU SAID THESE CELLS CAN ALSO BE
18 BRONCHIOLOALVEOLAR, I THOUGHT YOU WERE SAYING IT COULD BE
19 SOMETHING ELSE BESIDES THAT, TOO.
20 A. WELL, THE THING IS, IS THAT IT'S A LITTLE
21 CONFUSING. BECAUSE MOST OF THE NORMAL LUNG CANCERS ARE
22 DERIVED FROM ONE OF THESE TWO CELLS, BUT THEY CAN FORM ALL
23 DIFFERENT PATTERNS. THEY CAN FORM A PAPILLARY PATTERN. THEY
24 CAN FORMA A BRONCHIOLOALVEOLAR PATTERN. THEY CAN FORM AN
25 ACINAR PATTERN, OR A SOLID PATTERN. AND THEN THEY CAN ALSO
26 UNDERGO SOME REAL CHANGES, WHICH I'LL SHOW A LITTLE BIT
27 LATER.
28 AND HERE'S JUST A REAL HIGH POWER. PROBABLY
2887
1 TAKEN UNDER WHAT'S CALLED OIL IMMERSION, PROBABLY WITH 1200
2 MAGNIFICATION. THERE, YOU CAN SEE THE INDIVIDUAL CANCER
3 CELLS, AND YOU SEE THE BLUISH PART OF IT. THAT'S THE
4 NUCLEUS. AND THEN YOU SEE THE RED DOTS IN THE CENTER.
5 THAT'S THE NUCLEUS. AND THE NUCLEUS HAS THE DNA AND THE
6 NUCLEOLUS HAS THE RNA. AND THE RNA TRANSCRIBES THE DNA.
7 THAT MEANS, IT COPIES THE DNA AND THEN TAKES IT OUT INTO THE
8 CYTOPLASM AND TELLS IT WHAT TO DO.
9 AND TYPICALLY, THOSE CELLS, IN NORMAL
10 SITUATIONS, THEY PRODUCE WHAT'S CALLED SURFACTANT, WHICH IS A
11 MATERIAL THAT REDUCES THE SURFACE TENSION IN YOUR AIR SACS SO
12 YOU CAN HAVE -- WHICH FACILITATES OXYGENATION OF THE BLOOD.
13 HERE'S AN AREA HERE WHERE THE TUMOR HAD MORE OF
14 AN ACINAR PATTERN. AND BY THAT, I MEAN, INSTEAD OF BEING
15 ALONG -- TYPICAL ALVEOLAR WALL STRUCTURES, LIKE YOU COULD SEE
16 RIGHT HERE, IT'S STARTING TO FORM THESE CIRCULAR STRUCTURES,
17 WHICH LOOK MORE LIKE ORDINARY GLANDS. AND THAT'S REFERRED TO
18 AS ACINAR, A-C-I-N-A-R. SO THERE'S AREAS WHERE THE TUMOR
19 LOOKS LIKE THAT.
20 AND THEN THE INTERESTING THING -- OR I SHOULD
21 SAY, INTERESTING, AT LEAST TO A PATHOLOGIST -- IS THAT IN THE
22 LYMPH NODES AROUND THE RIGHT UPPER LOBE THAT WAS REMOVED,
23 WHICH ARE CALLED HILAR, H-I-L-A-R, LYMPH NODES AND THE LYMPH
24 NODES THAT WERE AROUND THE TRACHEA, WHICH ARE CALLED
25 PARATRACHEAL INFLUENCE, THEY CONTAINED METASTATIC TUMOR.
26 AND THIS IS AN EXAMPLE OF A LYMPH NODE OR A
27 PART OF A LYMPH NODE, AND THE "C" OUT THERE ON THE LEFT IS
28 THE CAPSULE OF THE LYMPH NODE, AND THEN THE BLUISH CELLS THAT
2888
1 YOU CAN SEE RIGHT HERE, ALL OF THESE CELLS, THOSE ARE NORMAL
2 LYMPHOCYTES IN THE LYMPH NODE.
3 AND THEN YOU CAN SEE, THERE'S A DIFFERENCE
4 BETWEEN HERE AND HERE. AND WHAT THIS -- THIS IS
5 METASTATIC CANCER. THAT IS CANCER THAT HAS SPREAD
6 TO THE LYMPH NODE FROM THE PRIMARY LUNG CANCER.
7 BUT WHAT'S INTERESTING ABOUT IT -- WHOOPS.
8 I GUESS WE DIDN'T HAVE THAT AT HIGHER POWER VIEW. I'M SORRY.
9 THOSE CELLS LOOK TOTALLY DIFFERENT THAN THE
10 PRIMARY TUMOR. AND THAT'S NOT SURPRISING, BECAUSE THE WAY
11 CANCERS SPREAD IS THAT THEY UNDERGO THESE GENETIC MUTATIONS,
12 AGAIN, TO PRODUCE THINGS THAT ALLOW THEM TO METASTASIZE, AND
13 THOSE CELLS LOOK LIKE WHAT ARE CALLED THE SIGNET RING,
14 S-I-G-N-E-T, RING CELLS THAT HAD MUCOUS IN THEM, WHICH WAS
15 DIFFERENT THAN THE CELLS OF THE PRIMARY TUMOR.
16 AND THEN THERE'S A COUPLE OF OTHER THINGS THAT
17 WE'RE SHOWING. IS THAT THIS IS A LYMPHATIC CHANNEL RIGHT
18 HERE. AND A LYMPHATIC CHANNEL IS A CHANNEL THAT'S LINED BY
19 THESE CELLS HERE, WHICH ARE CALLED ENDOTHELIAL,
20 E-N-D-O-T-H-E-L-I-A-L, CELLS, AND RIGHT INSIDE OF THIS
21 LYMPHATIC CHANNEL IS CANCER.

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22 SO IT'S GAINED ACCESS TO THE LYMPHATIC
23 CHANNELS. HERE'S THE MUCOUS PRODUCTION CLEAR, RIGHT HERE,
24 FOR EXAMPLE, AND THAT'S HOW IT SPREADS.
25 Q. ARE THERE MORE SLIDES?
26 A. THERE'S JUST ONE MORE.
27 AND THIS SHOWS A COUPLE THINGS. IT SHOWS AN
28 AREA WHERE THERE'S NOT CANCER. IT'S NOT NORMAL, BUT IT
2889
1 SHOWS -- THESE ARE THE SMOKERS' MACROPHAGES HERE, HERE, HERE,
2 HERE, HERE, HERE.
3 THE ALVEOLI, WHICH ARE THESE STRUCTURES HERE,
4 ARE LINED BY THICKENED WALLS THAT HAVE AN INCREASED AMOUNT OF
5 CONNECTIVE TISSUE, AND THERE'S DILATION IN THESE ALVEOLI.
6 AND MYSELF, I DIDN'T SEE ANY DESTRUCTION, SO
7 I'M NOT SURE I CAN DIAGNOSE EMPHYSEMA, BUT THERE IS A DILATED
8 AIR SPACE HERE, WHICH IS ONE OF THE FEATURES OF EMPHYSEMA.
9 Q. SO LET'S JUST TAKE THAT LAST PART. IT'S
10 GOT -- THAT PARTICULAR SLIDE HAS A FEATURE OF EMPHYSEMA, BUT
11 NOT ENOUGH FOR YOU TO DIAGNOSIS IT?
12 A. I COULDN'T SEE TISSUE DESTRUCTION, SO I
13 WOULDN'T DIAGNOSIS EMPHYSEMA UNLESS YOU COULD SEE TRUE TISSUE
14 DESTRUCTION.
15 I THINK THAT'S THE LAST ONE.
16 Q. OKAY. JUST STAY THERE ONE SECOND, IF YOU
17 WOULD. I MEAN, YOU CAN SIT DOWN. BUT ON -- I MEAN, ON THIS
18 SLIDE.
19 IF THOSE MACROPHAGES WEREN'T SMOKERS'
20 MACROPHAGES, WOULD THEY BE LESS DARK THAN WE'RE SEEING RIGHT
21 NOW?
22 A. THEY WOULD BE LESS DARK, AND YOU WOULDN'T SEE
23 ANYTHING LESS TO THAT MANY.
24 Q. WE'VE DISCUSSED THE COLORATION PART ALREADY.
25 WHY WOULDN'T WE SEE ANYTHING CLOSE TO THAT MANY
26 IF IT WASN'T SMOKERS' MACROPHAGES?
27 A. BECAUSE IF YOU WEREN'T INTRODUCING FOREIGN
28 MATERIAL INTO YOUR LUNG, THERE WOULDN'T BE ANY NEED FOR THOSE
2890
1 CELLS TO DIVIDE AND INCREASE IN NUMBER TO TAKE CARE OF THE
2 FOREIGN MATERIAL.
3 Q. IF THERE WAS NOTHING FOREIGN IN THE LUNG, LIKE
4 THE PARTICULATE FROM TOBACCO SMOKE, APPRECIATING THE FACT
5 THAT THEY'D BE A DIFFERENT COLOR, WOULD WE SEE ANY OR MAYBE
6 ONE?
7 A. YOU COULD SEE A FEW, BUT YOU WOULDN'T SEE --
8 YOU'D SEE HARDLY ANY. YOU'D SEE HARDLY ANY. MOST SPACES
9 WOULD NOT CONTAIN ANYTHING IN THEM.
10 THE OTHER THING YOU WOULDN'T SEE IS THOSE. THE
11 WALLS OF THOSE AIR SACS ARE ALSO ABOUT ANYWHERE FROM TWO TO
12 ABOUT TEN TIMES THICKER THAN NORMAL.
13 Q. WHAT'S THE SIGNIFICANCE OF THE FACT THAT THE
14 WALLS ARE MUCH THICKER THAN NORMAL?
15 A. THAT'S ANOTHER TYPE OF CHANGE THAT'S FREQUENTLY
16 SEEN IN CIGARETTE SMOKERS.
17 Q. GOT YOU. OKAY. SO THANK YOU.
18 JUST AS AN OVERVIEW HERE, BEFORE WE TURN OFF
19 THAT PROJECTOR.
20 WHEN YOU WENT THROUGH -- OR THE COMPUTER.
21 WHEN YOU WENT THROUGH THE SLIDES, YOU TOLD US
22 YOU SAW SOME ACINAR-TYPE CELLS?
23 A. I SAW SOME AREAS OF ACINAR DIFFERENTIATION.
24 Q. DIFFERENTIATION. SORRY.
25 PAPILLARY DIFFERENTIATION?
26 A. YES.

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Q. AND BRONCHIOLOALVEOLAR DIFFERENTIATION?
A. YES.

2891

Q. ALL OF THEM?
A. YES.
Q. DOES THE FACT THAT YOU SAW ANY ONE SUBTYPE MEAN IT ISN'T ADENOCARCINOMA?
A. NO.
Q. DOES THE FACT THAT YOU SAW ANY ONE SUBTYPE MEAN THAT IT'S AN ADENOCARCINOMA DOMINATED BY THAT PARTICULAR SUBTYPE?
A. NO.
Q. IS THERE A SUBTYPE WHICH DOMINATES HERE?
A. IF YOU HAD TO PICK ONE, IT WOULD BE PAPILLARY. BUT THERE'S -- ALL THREE SUBTYPES ARE ALL THREE AREAS OF DIFFERENTIATION.
Q. SO DR. GELLER OVER AT CEDARS PICKED PAPILLARY. IF I TWISTED YOUR ARM AND SAY YOU'VE GOT TO PICK ONE, IS THAT THE ONE YOU'D PICK?
A. I WOULDN'T HAVE SIGNED IT OUT LIKE THAT. I WOULD HAVE SIGNED IT OUT AN ADENOCARCINOMA SHOWING VARIABLE-TYPE DIFFERENTIATION. FROM A PRACTICAL POINT OF VIEW, LIKE I SAID, IT DOES NOT MAKE ANY DIFFERENCE.
Q. THIS IS THE END OF THIS SEGMENT OF MY QUESTIONING.
NOW, IF WE GO TO THE WORLD HEALTH ORGANIZATION, "HISTOLOGICAL TYPING OF LUNG AND PLEURAL TUMORS," WOULD IT CALL IT THE SAME THING YOU JUST CALLED IT?
A. YES. I THINK IF YOU LOOK -- I THINK IT'S ON PAGE 13 IN THERE, IF YOU LOOK UNDER ADENOCARCINOMA, THEY MAKE A DEFINITE STATEMENT, I THINK, IN THE VERY FIRST PARAGRAPH

2892

THAT MOST ADENOCARCINOMAS SHOW MIXED PATTERNS. THAT'S HOW IT STARTS OUT. MAYBE IT'S PAGE 12.
Q. WHICH PAGE?
A. IT'S PAGE 12.
Q. JUST READ IT, WOULD YOU.
A. IT SAYS -- THIS IS THE FIRST PARAGRAPH UNDER THE HEADING "ADENOCARCINOMA." IT SAYS (READING):

"SUBCLASSIFICATION OF ADENOCARCINOMA IS FRAUGHT WITH DIFFICULTIES, SINCE THESE TUMORS ARE HIGHLY HETEROGENOUS HISTOLOGICALLY. WITH ONLY A MAJORITY OF CASES SHOWING A PURE HISTOLOGICAL PATTERN, THE CURRENT CLASSIFICATION RECOGNIZES THAT MOST ADENOCARCINOMAS WILL BE OF THE MIXED SUBTYPE."

Q. SO YOU SAID HIGHLY HETEROGENOUS HISTOLOGICALLY?
A. RIGHT.
Q. WHAT IN THE WORLD IS THAT?
A. "HISTOLOGICALLY" MEANS HOW THE CANCER LOOKS IF YOU WERE LOOKING AT IT THROUGH A MICROSCOPE, LIKE THOSE SLIDES ARE. THAT REFERS TO HISTOLOGY. "HISTOLOGY," MEANING TISSUE AND "HETEROGENOUS" MEANS IT'S GOT VARIABLE PATTERNS, OR IT SHOWS A DIFFERENCE BETWEEN ONE AREA AND ANOTHER AREA RATHER THAN BEING "HOMOGENEOUS" WOULD BE THE SAME IN ALL AREAS.

2893

Q. SO HIGHLY HISTOLOGY --
SAY IT AGAIN?

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A. HISTOLOGICAL.
Q. HISTOLOGICALLY --
A. HETEROGENOUS.
Q. -- HETEROGENOUS. HIGHLY HETEROGENOUS?
A. RIGHT.
Q. ALL MIXED UP?
A. RIGHT.
Q. NOT ME; THAT'S WHAT IT MEANS?
A. THAT'S WHAT IT MEANS. IT MEANS ALL DIFFERENT PATTERNS.
MR. PIUZE: OKAY, YOUR HONOR. I'M SORT OF KEEPING SCORE OF THE TIME.
THE COURT: THAT WOULD BE JUST FINE. THANK YOU VERY MUCH, SIR.
ALL RIGHT. LADIES AND GENTLEMEN, BE BACK AT 3 O'CLOCK.
DON'T DISCUSS THE CASE WITH ANYBODY.

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